

- ▶ Improved material properties open new markets and applications for stock shapes
- ▶ Unique aspect ratio creates uniform, void-free shapes
- ▶ Better processing, higher yields & performance with one material

### ADDITIONAL BENEFITS

- Bridge material performance gap between compression and injection molding
- Fully-compounded, patent-pending custom engineered solutions
- Additives & fibers completely wetted with resin for best performance
- Less molded-in stress, better dimensional stability, and very low porosity
- Easy material handling – No blending steps or dust issues
- Achieve higher production yields with each cycle
- Compatible with many high temperature engineering resins

Imagine thermoplastic compounds that deliver dramatic improvements to the physical properties of polymer shapes, while at the same time increasing production yields and reducing manufacturing costs. At RTP Company, we not only imagined them, we've made them a reality.

Controlled geometry pellets (CGP) have a unique patent-pending design optimized for compression molding – featuring precision width-to-thickness and length-to-width aspect ratios which allow them to tightly nest – producing stock shapes and thick-walled parts with superior mechanical properties.

Performance improvements from 20% to 160% are possible, allowing shapes to be used in new applications that could not be previously met by plastics. As a fully compounded solution, fibers and additives in CGP are completely wetted with polymer, providing the highest performance benefit possible.

With CGP, shapes are more uniform and void-free; better dimensional stability, less molded-in stress, and very low porosity allows production of precision parts with lower reject rates. Reduced compaction and improved packing ratios result in higher production yields without the material handling and blending requirements of powder mixes.

Multiple additives such as fibers, reinforcements, lubricants, other modifiers, and color can all combined into a single pellet that is custom engineered to your performance criteria. Initially available in PEEK and PPS compounds, the technology can be extended to other thermally stable resins like PES, PEI, and PPA.

Controlled geometry pellets...another innovation from RTP Company: your global compounder of custom engineered thermoplastics.



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## CONTROLLED GEOMETRY PELLETS

In addition to the physical property improvements and simplified handling provided by working with precompounded pellets, CGP also increases production yields and boosts margins. CGPs unique tight nesting shape not only eliminates most voids and resulting rejects, but its reduced compaction ratio and improved packing ratio allows production of net shapes up to two times longer than dry blended feedstocks, increasing output with no additional labor or machine time.

$$\begin{array}{ccc}
 \text{Controlled Aspect Ratio} & & \text{Reduced Compaction Ratio}^* \\
 + & = & \& \\
 \text{Controlled Axial Length} & & \text{Improved Packing Ratio}^*
 \end{array}$$

\* Compaction ratio= Cavity size required to produce a measured unit of molded article • Packing ratio= Geometry maximizes pellet stacking in available space and reduces material overlap.

### Compression Molded CGP Properties Comparison

	Dry Blended PEEK w/30% Carbon Fiber	RTP 2299 X 120320 B CGP PEEK w/30% Carbon Fiber	CGP Improvement
Specific Gravity	1.42	1.41	
Notched IZOD 1/8" section	1.03 ft-lbs/in 55 J/m	1.55 ft-lbs/in 83 J/m	+ 50 %
Tensile Strength	14,000 psi 96 MPa	19,500 psi 134 MPa	+ 40 %
Tensile Elongation	2.0 %	4.0 %	+ 100 %
Tensile Modulus	800,000 psi 5,512 MPa	2,100,000 psi 14,469 MPa	+ 160 %
Flexural Strength	30,000 psi 207 MPa	35,500 psi 245 MPa	+ 20 %
HDT	450°F 230°C	600°F 315°C	+ 33 %

Average value for compression molded samples from three different processors

### Available CGP Grades

Polymers	Additive Enhancements
RTP 1300 Series PPS Polyphenylene Sulfide	<ul style="list-style-type: none"> <li>• Glass fiber reinforcement</li> <li>• Carbon fiber reinforcement</li> <li>• PTFE &amp; other lubricants</li> <li>• Thermal conductivity</li> <li>• Industrial colors</li> </ul>
RTP 2200 Series PEEK Polyetheretherketone	<ul style="list-style-type: none"> <li>• Glass fiber reinforcement</li> <li>• Carbon fiber reinforcement</li> <li>• PTFE &amp; other lubricants</li> <li>• Industrial colors</li> </ul>

Additional custom formulations are available to meet specific performance criteria

### RTP Company: Your Global Compounder Of Custom Engineered Thermoplastics

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